THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH INVESTIGATIONS BRANCH

PERCHLORATE IN DRINKING WATER

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Perchlorate, a chemical used in the manufacture of rocket fuel, was discovered in five drinking water supply wells west and southwest of the Aerojet property in Rancho Cordova in February, 1997. Since that time, the California Department of Health Services (DHS) has been advising the water service companies in order to ensure that the level of perchlorate in drinking water is well below the amount which could cause a health problem. This fact sheet will explain how perchlorate got in the water, what effects perchlorate can have on your health, and how DHS decides about safe levels of perchlorate in drinking water.

How Did Perchlorate Get in the Drinking Water?

The Aerojet Corporation began manufacturing liquid and solid propellants for rocket systems and assembling and testing the rocket systems in 1951. In 1979, state and federal agencies discovered that perchlorate and a group of chemicals called volatile organic compounds (VOCs) were migrating in the groundwater from the Aerojet site toward the American River. In 1988, Aerojet began removing the shallow groundwater and taking out the VOCs. This treated water was then reinjecting into the deep groundwater at the western edge of the Aerojet property. Since there is currently no treatment for perchlorate, the water that was reinjected still contained perchlorate. The perchlorate-contaminated groundwater has since migrated toward public water supply wells.

State agencies are investigating other potential sources of perchlorate in the area such as the former McDonnell Douglas facility and the Purity Oil Sales facility.

How Was Perchlorate Discovered in the Drinking Water Wells?

Since Aerojet began reinjecting the treated water, they have been required to test for perchlorate in the groundwater on a regular basis to ensure that it has not migrated off the property. In the past, the levels at which Aerojet was able to detect perchlorate in the water were much higher than the levels at which there could be some type of health effect. Recently, Aerojet changed to a method which detects perchlorate at much lower levels. This method indicated that the levels in some of the drinking water wells were of potential public health concern.

How Could Perchlorate Affect My Health?

Perchlorate could interfere with the function of the thyroid. At high levels, perchlorate interferes with the production of thyroid hormones and could result in a below normal level of thyroid hormone in the body. This condition is called hypothyroidism. In some cases, the pituitary gland responds to the low level of hormone by producing thyroid stimulating hormone (TSH). This increase in TSH can cause the thyroid gland to become enlarged. People with hypothyroidism can feel sluggish, depressed, cold, or tired. However, these complaints may not necessarily be related to hypothyroidism but could be caused by many other conditions. Thyroid disorders are very common, and are more frequent in females than in males.

At one time, one form of hyperthyroidism (a condition in which the thyroid produces an *above* normal level of thyroid hormone) was treated with perchlorate because it effectively reduces the production of thyroid hormones. A few patients who were treated with perchlorate developed disorders of the blood or immune system. However, there is not enough information to know if these problems were caused by perchlorate.

Is There a Test to Show If I Have Thyroid Problems?

Yes. There are simple blood tests which can measure the amount of TSH from the pituitary gland and test for the level of thyroid hormone. Most diseases of the thyroid can be treated, so you should contact your physician if you think that you might have a thyroid condition.

What Happens When I Am No Longer Exposed to Perchlorate?

Although this is highly unlikely, if exposure to perchlorate did have an effect on your thyroid, the thyroid would be able to resume its normal functioning shortly after stopping exposure to perchlorate.

Is It Safe to Drink Water with Perchlorate?

Based on studies of perchlorate, the Drinking Water Program of the California Department of Health Services has set levels for perchlorate in drinking water that are protective of your health (18 parts of perchlorate per billion parts of water also known as 18 ppb). Even if you are pregnant or have an infant or a child in your home, it is not harmful to use drinking water from the tap.

Currently, there are studies being conducted which will further clarify the safe level for perchlorate in drinking water. Your water company will keep you informed if the perchlorate gets above the health protective level.

No commercially available water filtering system is able to remove perchlorate, but bottled water can be used as a substitute.

How Did DHS Decide What are the Safe Levels for Perchlorate in Drinking Water?

In 1992 and again in 1995, the US Environmental Protection Agency (USEPA) reviewed all available toxicological data on perchlorate: studies of patients who were being treated medically with perchlorate, and animal studies where rats, mice, or rabbits were given varying amounts of food or water containing perchlorate. The USEPA determined that while there was considerable information about the effects of short-term exposure to perchlorate on the thyroid, there was not enough information about the effects of long-term exposure.

In order to determine a safe level for a given chemical in drinking water, scientists rely on information from health studies. When there is limited information available, scientists include a large margin of safety until there is sufficient information to develop a permanent standard.

DHS set a temporary safe level for perchlorate at 18 ppb. This level includes a 300-fold margin of safety. In other words, this level is 300 times less than the level at which no health effects were observed in prior studies.

In terms of your drinking water consumption:

If your water is reported to contain 250 ppb of perchlorate and you drank 2 liters (8 cups) of that water per day, you would still be taking in an amount of perchlorate that is 20 times lower than the amount at which no health effect was observed. If your water is reported to contain 12 ppb of perchlorate and you drank 2 liters (8 cups) of that water per day, you would still be taking in an amount of perchlorate that is 450 times lower than the amount at which no health effect was observed.

For More Information

For further information about perchlorate in the drinking water and the health effects:

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